January 24, 2017

6-5 Graphing Exponentials

I can graph exponential functions given an equation

I can identify key features from an equation or a graph

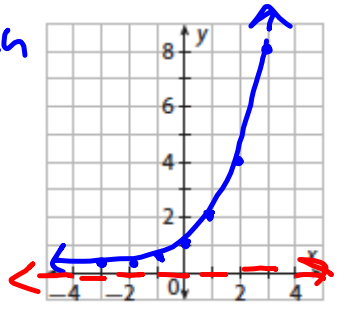
Complete the input-output table for each of the parent exponential functions below.

x	$f(x) = 2^x$
−3	$2^{-3} = .125$
−2	$2^{-2} = .25$
−1	$2^{-1} = .5$
0	$2^0 = 1$
1	$2^1 = 2$
2	$2^2 = 4$
3	$2^3 = 8$

x	$f(x)=(1/2)^x$
−3	$(1/2)^{-3} = 8$
−2	$(1/2)^{-2} = 4$
−1	$(1/2)^{-1} = 2$
0	$(1/2)^0 = 1$
1	$(1/2)^1 = .5$
2	$(1/2)^2 = .25$
3	$(1/2)^3 = .125$

Graph the functions $f(x)=2^x$ and $f(x)=(1/2)^x$

growth



decay

$y = 0$

Domain: $(-\infty, \infty)$ all exponentials!

Range: $(0, \infty)$ $(\text{asymptote}, \infty)$ H.

y-int: $(0, 1)$ $(0, \text{where H crosses})$ x

What is the domain of each function?

$(-\infty, \infty)$

What is the range of each function?

$(0, \infty)$

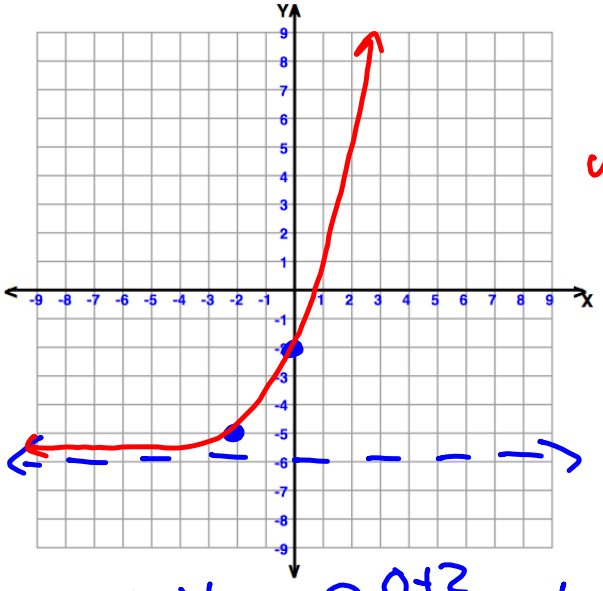
What is the y-intercept of each function?

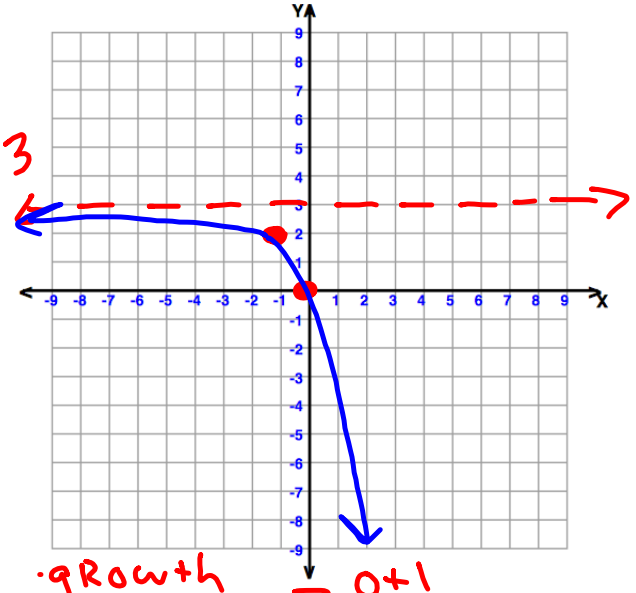
$(0, 1)$

Graphing Task

Graph each function and state the domain, range, y-intercept, and asymptote for each.

$$g(x)=2^{x+2}-6 \qquad h(x)=-3^{x+1}+3$$





·growth
·down 6
·left 2

$2^{0+2}-6$

$4-6=-2$

·growth
·up 3
·flip
·left 1

$-3^{0+1}+3=0$

D: $(-\infty,\infty)$

R: $(-6,\infty)$

y-int $(0,-2)$

HA: $y=-6$

D: $(-\infty,\infty)$

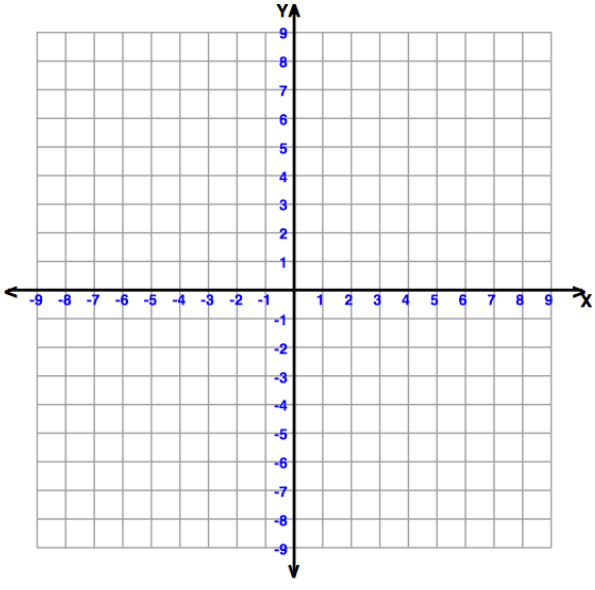
R: $(-\infty,3)$

y-int $(0,0)$

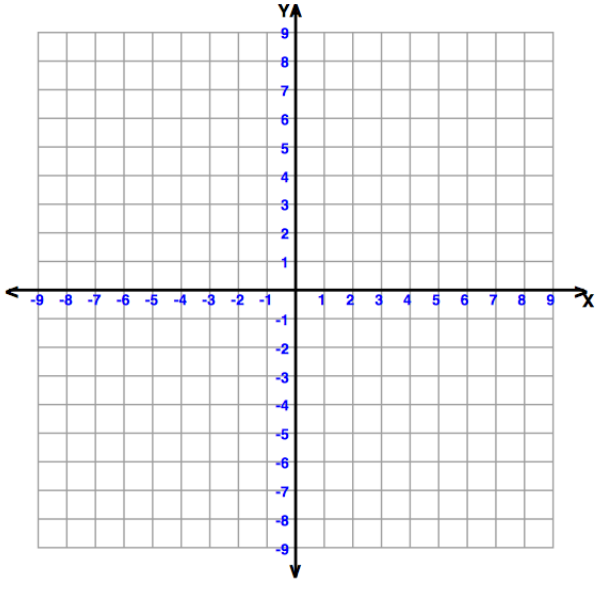
HA $y=3$

Graph each function and state the domain, range, y-intercept, and asymptote for each.

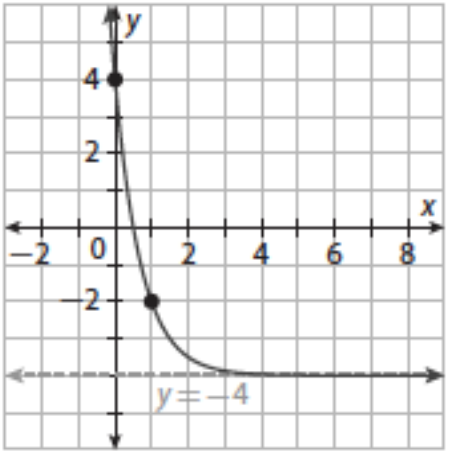
$$f(x)=\frac{1}{2}^{x-2}-2$$



$$f(x)=\frac{1}{3}^{x+2}+4$$



State the domain, range, y-intercept, asymptote, increasing, decreasing, and end behavior.



Domain:

Range:

Y-intercept:

Horizontal Asymptote:

End Behavior: